CLAIMS

What is claimed is:

1. An apparatus for ion implanting a plurality of workpieces, comprising:

an ion source for generating an ion beam having a scan width and a scan distance which defines a predetermined scan area;

a holder for receiving said workpieces that are arranged so as to maximize the surface area of said workpieces present within said predetermined scan area; and

a scanner for scanning said ion beam over said predetermined scan area so that the utilization efficiency of said ion beam on said workpieces is increased.

2. An apparatus according to claim 1 wherein said workpieces are semiconductor wafers.

3. An apparatus according to claim 2 wherein said ionbeam is a ribbon beam.

4. An apparatus according to claim 3 wherein said ribbon beam has a 300mm scan width and the diameter of said wafers is 200mm.

5. An apparatus according to claim 2 wherein said holder comprises a platen sufficiently sized for receiving said semiconductor wafers.

6. An apparatus according to claim 2 wherein said holder comprises a plurality of platens arranged within said predetermined scan area.

7. An apparatus according to claim 6 wherein said plurality of platens corresponds to the number of said wafers.

8. An apparatus according to claim 6 wherein the number of said platens is less than the number of said wafers.

9. An apparatus according to claim 2 wherein said scan distance of said ion beam is varied depending upon the number of said wafers.

10. An apparatus according to claim 9 wherein said scan distance is varied by a formula:

$$d_s = \sqrt{D_w^2 - (w_s - D_w)^2} * (Q_w - 1) + D_w + OS$$

where d_s = said scan distance, D_w = the diameter of said wafers, w_s = said scan width, Q_w = quantities of said wafers/holder, and OS = a standard overscan of said ion beam.

11. A holder for receiving a plurality of workpieces, comprising:

a scan for for receiving said workpieces;

wherein said scan area is defined by a scan width and a scan distance that is sufficient for arranging said workpieces thereon so as to maximize the surface area of said workpieces present within said scan area.

12. A holder according to claim 11 wherein said workpieces comprise semiconductor wafers.

13. A holder according to claim 12 further comprising a platen for receiving said workpieces.

14. A holder according to claim 11 further comprising a plurality of platens arranged within said scan area.

15. A holder according to claim 12 wherein said scan distance is varied depending upon the number of said workpieces and said scan width remains constant and the holder is used for implanting said workpieces by an ion beam.

16. A holder according to claim 15 wherein said scan distance is varied by a formula:

$$d_s = \sqrt{D_w^2 - (w_s - D_w)^2} * (Q_w - 1) + D_w + OS$$

where d_s = said scan distance, D_w = the diameter of said wafers, w_s = said scan width, Q_w = quantities of said wafers/holder, and OS = a standard overscan of said ion beam.

17. A method for ion implanting a plurality of workpieces, comprising the steps of:

generating an ion beam having a scan width and a scan distance which defines a predetermined scan area;

arranging said plurality of wafers on a holder so as to maximize the surface area of said workpieces within said predetermined scan area; and

scanning said ion beam over said predetermined scan area sot that the utilization efficiency of said ion beam on said wafers is increased.

18. A method according to claim 17 wherein said workpieces are semiconductor wafers.

19. A method according to claim 17 wherein said scan distance of said ion beam is varied depending upon the number of said workpieces.

20. A method according to claim 19 wherein said scan distance of said ion beam is varied depending upon the number of said workpieces.